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CENTRAL INTELLIGENCE AGENCY

REPORT

50X1-HUM

INFORMATION REPORT

COUNTRY Germany (Russian Zone)

DATE DISTR. 30 September 1948

SUBJECT Servo Motors Used for Guided Missiles

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1. Four hundred and fifty "Wasserfall" rudder servo motors (Component No. 1.09) have been ordered from the Gelmig plant at Martha Seydewitz. In addition 150 "ILE" generators have been ordered.
2. Both these components are tested by Konstruktions-Technisches Büro 20, Dresden-Niedersedlitz (K.T.B. 20). So far 45 servo motors have been delivered, and have been found satisfactory. Difficulties have been encountered with the I.S. generators, as a result of inaccurate assembly, the use of substandard materials, badly wound armature rotors, faults in the governor and other mechanical faults. Consequently the generator program has fallen behind, and K.T.B. 20 has taken over assembly of this component. Major Frischmann took five satisfactory specimens to Berlin on 13 February.

3. Characteristics of the 1.09 Servo Motor. (See attached Appendices 1 & 2)

a) Electrical Characteristics.

This is a D.C. motor with outside excitation, the armature is a low inertia ironless type. The exciter has two poles.

Exciter tension: 24 volts D.C.
Exciter current: 1.3 amps when cold.
1.4 amps when warm.

Field Resistance: 15.2 ohms $\pm$ 5% without load.
Armature current: 0.72 amps $\pm$ 10% at 12 volts and 6,650 r.p.m. $\pm$ 1%

Temperature of the winding reaches 65°C after 4 minutes running at 35 watts.

12	"	"	16
16	"	"	4.5"

b) Wiring

Field winding: 530 windings 0.55 mm varnished copper wire.
Armature: 22 slots each with 10 coils of 0.4 mm varnished copper wire.
Collector rings: Made of silver alloy (80% silver: 20% copper) with 11 divisions.
Brushes: Made of silver graphite 9 x 5 x 5 mm (90.5% silver: 9.5% copper) - Pressure at the brushes 40-50 gm.

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c) Mechanical Characteristics.

Total weight: 1.7 Kg.
 Total friction of the motor = 70 cmg.
 Armature balanced to less than 0.35 cmg.
 Inertia movement of the armature = 0.05 cmg. seconds²
 Longitudinal play : .01 mm $\pm$ 0.05 mm.

3. d) Construction

Housing of steel tubing 74 mm in diameter.
 Length 105 mm with two openings for brush adjustment.
 Exciter poles and pole shoes in one piece, secured to the housing by 4 screws.
 The cylindrical armature is made of stiff paper.
 The windings are secured by varnish and bandages.
 The ball-bearings are of two different sizes.
 The leads are 600 mm long, and go through the end plate on the collector ring side. From the end plate which carries the drive, an iron core protrudes into the armature, so that there is an air slot 2.05 mm wide between the core and the poles in which the paper cylinder is running. The shaft is splined on the driving side with 7 splines (diameter 5.75 mm to 3.95 mm).

4. 65 and 66 pole Plug Union (See appendices 3a and 3b)

These plug unions have been developed and manufactured by K.T.B. 20.

a)

Dimensions	65 pole		66 pole	
	Socket	Plug	Socket	Plug.
Length	130	160	130	160 mm
Width	100	140	100	140 mm
Height	320	170	320	170 mm
Weight	4.4	1.4	4.3	1.35 Kg.
Contacts	58 x 8 amps. 7 x 20 amps.		66 x 8 Amps.	
Number of magnetic windings	2490		2490 copper wire 0.28 mm	
Resistance against cold	73 ohms.		73 ohms.	
Self-absorbed power	8 watts.		8 watts.	

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Contacts	58 x 8 amps. 7 x 20 amps.		66 x 8 Amps.	
Number of magnetic windings	2490		2490 copper wire 0.28 mm	
Resistance against cold	73 ohms.		73 ohms.	
Self-absorbed power	8 watts.		8 watts.	

Direct current 24 volts = 10%

Casing: 2 mm steel sheet with welded-in carrier handle.

Contacts are in fibre plates and are protected against neither dust nor water.
 The connections to line are joined by screws.

- b) As soon as the magnet system receives tension, it moves a flapping armature which by means of a cog-wheel (2 teeth) pulls back the plug. In case of no tension, the plug is automatically projected outside through the detachment of the spring loaded flapping armature and the reflecting plate which is loaded four times. The holding power of the armature is 100 Kgs. To avoid sticking of the armature, it is laid on a 0.1 copper wall.

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Time of interruption from the moment of the decrease of tension is 50 +.s.m.

3. Russian Personalities of K.T.B. 20

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A Major or Colonel Erigen



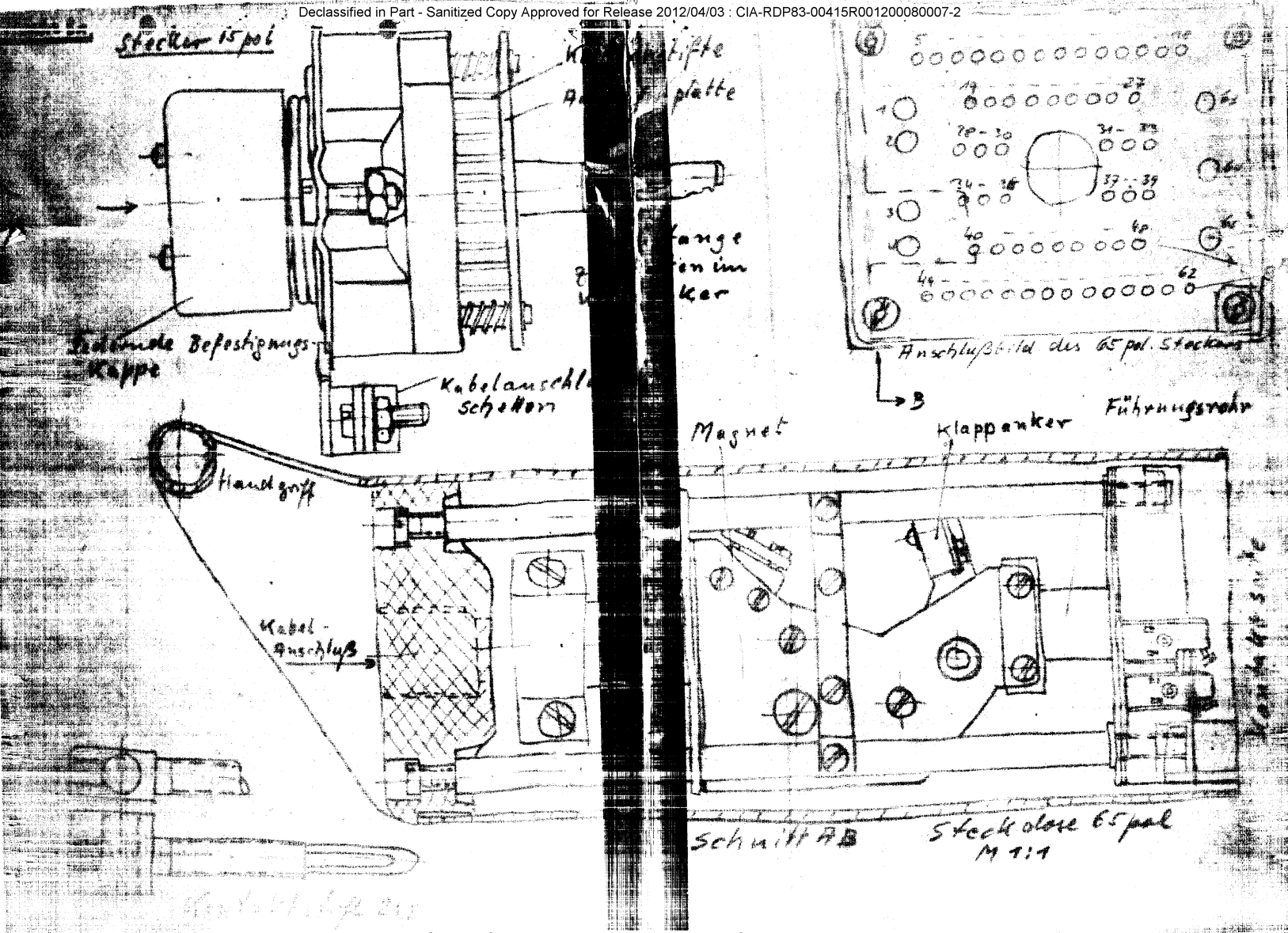
who holds the Order of Lenin, is in charge of the bureau.

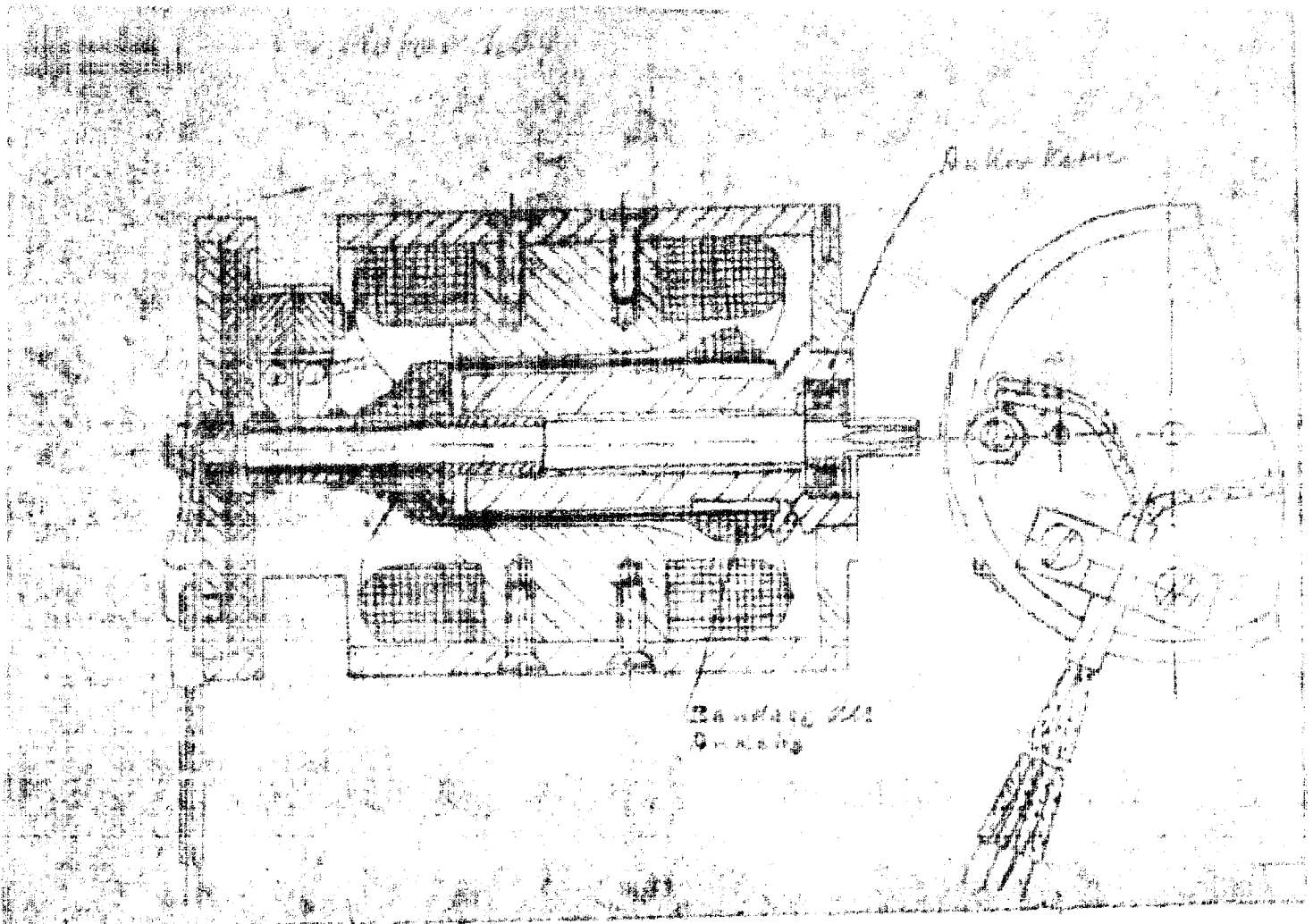


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APPENDIX B

